Ischemic stroke in a patient with interatrial block: Is it only a coincidence or a clear relationship?

Athanassios Antonopoulos¹, Laila Fiorani²

¹Cardiology Clinic; ²Neurology Clinic, Ospedale per gli Infermi, Faenza, AUSL Romagna, Faenza (RA), Italy

Abstract

Atrial fibrillation (AF) can be detected in nearly 25% of all patients with stroke by sequentially combining different electrocardiographic methods. Prediction of early cardio-embolic stroke remain a permanent challenge in everyday practice. The early identification of an increased risk for atrial fibrillation episodes (which are frequently asymptomatic) is essential for the prevention of cardioembolic events. One of the noninvasive modalities of atrial fibrillation prediction is represented by the electrocardiographic P-wave analysis. This includes study and diagnosis of interatrial conduction block. Our short case report presents a case with ischemic cortico-sottocortical stroke involving capsulo and caudo regions in a woman patient with interatrial block as realized by electrocardiographic P analysis.

Introduction

Description of the interatrial conduction blockade in 1979, classifying it into interatrial and intra-auricular blocks, suggested separating interatrial blocks (IAB) into two categories: a) partial, where there would be a delay in the conduction of the Bachmann’s region but most of the right-to-left conduction still occurs at an auricular ceiling level; and b) advanced where there is a total block of Bachmann’s region and the conduction towards the left atrium occurs from the lower part of the right atrium with a caudo-cranial retrograde direction mainly through the coronary sinus, and to a lesser extent through the fossa ovalis [1]. Moreover, IAB seems to be a key factor of atrial fibrillation (AF). Diagnosis of IAB are easy to perform using the surface ECG. It is partial when the P wave duration is ≥120 ms, and advanced if the P wave presents a biphasic pattern in II, III and aVF. IAB are very frequent in the elderly and, particularly in the case of the advanced type, they are associated with AF, and AF recurrences [2]. This association has been recently named Bayés syndrome [3]. Moreover, IAB increases risk of stroke [4], and seems to be associated with dementia [5]. Although the reasons for this association are still not clear, atrial remodeling due to delayed and abnormal left atrium activation, especially in case of advanced IAB, is probably the key factor in the chain of events that lead to atrial fibrosis.

We describe a case of a patient in whom detection of aIAB motivated extended cardiac monitoring resulting in the diagnosis of paroxysmal AF and a subsequent decision on full oral anticoagulation strategy.

Case Report

In September 2020 an 80-year-old woman patient with hypertension under treatment and chronic coronary syndrome revascularized in 2007 by coronary angioplasty in right coronary and left anterior descending coronary arteries with 2 stents placement, arrived in emergency room after an episode of syncope and fall. No palpitations, angina or dyspnea had been observed in the last 3 months. In June 2020 the patient performed an
echocardiography which had shown an hypokinesia in the inferior wall with normal biventricular global systolic function. Initial degeneration of mitral and aortic cardiac valves with gradients max/medium of 16/10mmHg in aortic valve. Both right and left atrial were normal. During that period patient started with the following therapy: Metoprolol 25 mg twice daily, atorvastatin 40 mg once daily, foline 5 mg once daily, ramipril 5 mg once daily, hydrochlorothizide 25 mg once daily.

The days before her admission, patient was functionally independent with a good performance status. Her physical exam had shown a systolic heart murmur 2/6 with carotid irradiation. EKG was performed with sinus bradycardia (55 bpm), P duration 124 ms, PQ 182 ms, QTe 392ms. Moreover, cardiac telemetry did not show any evidence of arrhythmia. A Carotid Doppler ultrasound was negative for significant stenosis, but only bilateral atherosclerotic plaques were present. A transthoracic echocardiogram was negative for thrombus or severe atrial dilation; A Neurology evaluation performed revealed a left hemiparesis with partial disorientation in the space and time and hemiplegia mainly of the left superior art. CT of the head did not show any acute changes to explain the patient’s symptoms. Then the patient was admitted in the Neurology clinic for clinical and therapeutic FU.

Initial laboratory results were Hb 12.3g/dl, PLT 211000, creatinine 0.75 mg/dl, total cholesterol 159 mg/dl, LDL 90mg/dl, triglycerides 129mg/dl, TSH 2.960 mU/L, uric acid 3.9mg/dl, total bilirubin 0.63mg/dl, ALT 10U/L, Gamma GT 16 U/L, within normal limits. In the following day MRI with gadolinium of the brain revealed multifocal mildly increased diffusion signals, involving capsulo-lenticular and thalamic right regions. Moreover, another focus in the right temporal in sottocortical region and in right capsulo-lenticular and thalamic right regions. Additionally, Cotter and coworkers were observed a rapid increase of IAB prevalence from middle age to senescence. The last probably due to the degree of atrial fibrillation and the gradual modification of the specialized cardiac conduction system. In contrast, in young adults the prevalence of IAB is low, except in patients with cryptogenic stroke and patent foramen ovale that can be of 46% [11]. Moreover, in cardiac magnetic resonance and late gadolinium enhancement of the upper part of the septum involving Bachmann’s bundle has been reported, describing the association between IAB and atrial fibris [12]. As a result of the above condition an endothelium dysfunction may be present, with a hypercoagulable state comparable to that present in AF [13] and a stagnant and sluggish left atrium favoring the appearance of stasis -induced thrombosis, especially in the left appendage, even in absence of supraventricular arrhythmias. In the present case, cardiac telemetry did not show any evidence of arrhythmia, but a high CHA2DS2VAsc-score was observed (equal to 5) while no other previous arrhythmic events were reported.

Accordingly, some studies also suggest that patients with high CHA2DS2VAsc-score and IAB have a high stroke risk irrespective of the presence of AF [14,15]. These data support the notion that AF is a risk factor for ischemic stroke, but not necessarily the direct cause of it.
Figure 2. Some strips with episodes of paroxysmal atrial fibrillation were recorded in the ECG external event recorder monitoring.
On the other hand, an association between advanced IAB and supraventricular arrhythmias and poor left atrium contractility has been reported. This is called Bayés’ Syndrome [16]. This association may be explained by atrial fibrosis and left atrium enlargement. Also, this could be due to re-entry, as conduction disturbances increase refractory period dispersion. Finally, IAB is associated with premature atrial beats probably due to abnormal left atrium activation facilitating the initiation of re-entry and AF [17].

Despite the recent appreciation of IAB as a predictor of atrial fibrillation IAB is still underused in everyday clinical practice. On the other hand, the bedside ECG seems to be the simplest and most appropriate method that could aid clinicians to appreciate and recognize IAB and predict AF. In this case, was used to investigate the potential explanation of an ischemic stroke beyond the presence of a clear AF and eventually to decide for anticoagulant therapy initiation. It is well known that patients with advanced IAB without previous episodes of documented AF also have an increased risk of stroke, particularly in the presence of high CHA2DS2VASc score, and/or structural heart disease. However, at this time, we do not have clinical trials that support the use of anticoagulants in the absence of documented AF. Therefore, it is important to carry out monitoring to look for AF episodes that can support anticoagulation in these patients [18,19]. In fact, in considered patient, after a long-time monitoring, we found short repetitive runs of AF that support anticoagulation therapy. In conclusion, advanced IAB seems to be an appropriate method that could aid clinicians to appreciate and recognize IAB and predict AF. Therefore, it is essential to assess future studies which help to elucidate whether anticoagulation is needed in these patients.

References